

CLAIMS

What is claimed is:

1 A computer implemented method for calculating an importance
2 rank for N linked nodes of a linked database, the method
3 comprising the steps of:

- 4
5 (a) selecting an initial N-dimensional vector \mathbf{p}_0 ;
6 (b) computing an approximation \mathbf{p}_n to a steady-state probability
7 \mathbf{p}_∞ in accordance with the equation $\mathbf{p}_n = \mathbf{A}^n \mathbf{p}_0$, where \mathbf{A} is an
8 $N \times N$ transition probability matrix having elements $\mathbf{A}[i][j]$
9 representing a probability of moving from node i to node j ;
10 and
11 (c) determining a rank $r[k]$ for a node k from a k^{th} component
12 of \mathbf{p}_n .

13
1 2. The method of claim 1 wherein the matrix \mathbf{A} is chosen so
2 that an importance rank of a node is calculated, in part,
3 from a weighted sum of importance ranks of backlink nodes
4 of the node.

5
1 3. The method of claim 2 wherein the importance ranks of each
2 of the backlink nodes is weighted in dependence upon the
3 total number of links in the backlink node.

4
1 4. The method of claim 1 wherein the matrix \mathbf{A} is chosen so
2 that an importance rank of a node is calculated, in part,
3 from a constant α representing the probability that a
4 surfer will randomly jump to the node.

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1 5. The method of claim 1 wherein the matrix \mathbf{A} is chosen so
2 that an importance rank of a node is calculated, in part,

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Sub
A

3 from a measure of distances between the node and backlink
4 nodes of the node.

5
1 6. The method of claim 1 wherein the initial N-dimensional
2 vector p_0 is selected to represent a uniform probability
3 distribution.

4
1 7. The method of claim 1 wherein the initial N-dimensional
2 vector p_0 is selected to represent a non-uniform
3 probability distribution, wherein a predetermined set of
4 nodes is given a relatively large initial probability.

5
1 8. A computer implemented method for assigning a rank to N
2 nodes of a linked database, the method comprising calculating,
3 for a node, a weighted sum of ranks of backlink nodes to the
4 node, wherein each of the backlink nodes is weighted in
5 dependence upon the total number of links in the backlink node.

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A2
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6
add
A3

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